



# Australian Bureau of Statistics

## 1350.0 - Australian Economic Indicators, 1995

ARCHIVED ISSUE Released at 11:30 AM (CANBERRA TIME) 01/09/1995

### Feature Article - Experimental Price Indexes for Age Pensioner Households: An Update

This article was published in Australian Economic Indicators September 1995 issue on 1 September 1995.

In January 1992 the ABS, acting upon a recommendation of the House of Representatives Standing Committee on Finance and Public Administration, published an information Paper entitled 'The Australian Consumer Price Index: Feasibility of Constructing Price Indexes for Special Population Groups' (ABS cat. no. 6445.0). In that study experimental price indexes were constructed for age pensioner households and wage and salary earner households.

In presenting the results of the study the ABS undertook to regularly publish updated versions of the indexes. The first of these appeared in the July 1993 edition of Australian Economic indicators. This article presents a further update of the price indexes using a more refined methodology than was used in the original information paper and the 1993 update.

### Assumptions and methodology

In constructing the experimental indexes it has been assumed that current Consumer Price Index (CPI) samples provide basic price information relevant to each of the target population groups.

Weights for the experimental indexes were calculated as follows: average weekly expenditure data for the special population groups from the 1988-89 Household Expenditure Survey (HES) were aggregated to the expenditure classes used in the CPI. Adjustments were made for under reporting of spending on tobacco and alcohol, and expenditure aggregates were adjusted to 1989-90 levels using movements in the relevant components of the CPI. The resulting average weekly household expenditures were used to calculate weights, with the weight for any category of expenditure being the percentage of total expenditure for which it accounts.

Experimental index numbers were compiled by using weights, calculated separately for each population group, to combine existing CPI expenditure class index numbers. In previous studies separate weights were only applied at the major commodity group level.

The following definitions of special population groups were adopted:

- Age pensioner households - capital city households with the age pension as the largest source of income and a weekly income of less than \$175 in the case of one person households or \$290 in the case of two person households.
- Wage and salary earner households - capital city households deriving at least three quarters of their total income from wages and salaries, excluding the 10 per cent of such households with the highest incomes. While this population group is the same as the CPI

population, index outcomes differ from the CPI. This is because the CPI is calculated as a series of chain linked indexes for which the weights of component items are updated approximately every five years. By contrast, the experimental indexes presented here are based on a single set of weights.

## Weighting patterns

In constructing the CPI, household expenditure is divided into the following eight major commodity groups: food; clothing; housing; household equipment and operation; transportation; tobacco and alcohol; health and personal care; and recreation and education. These groups are divided in turn into 35 sub-groups and the sub-groups into 107 expenditure classes. For a detailed description of the CPI commodity classification see **A Guide to the Consumer Price Index** (ABS Cat. No. 6440.0).

Table 1 shows the average weekly expenditures at the major commodity group level, calculated from **HES data**, for each of the experimental populations. Table 2 lists the weights calculated for use in constructing the experimental indexes.

**Table 1 : Estimated Average Weekly Expenditure by Major Commodity Group**

CPI expenditure category	Age pensioner households \$	Wage and salary earner households \$
Food	49.13	115.60
Clothing	11.70	39.57
Housing	25.65	112.08
Household equipment and operation	33.38	112.57
Transportation	20.93	98.80
Tobacco and alcohol	10.44	42.60
Health and personal care	15.11	37.49
Recreation and education	10.84	66.81
<b>Total</b>	<b>177.18</b>	<b>625.52</b>

Table 1 shows that there are significant differences in absolute expenditure between the two population groups, with wage and salary earner households spending significantly more than age pensioner households on all major commodity groups. However, the relevant comparison in studying the behaviour of price indexes, is the proportion of total expenditure accounted for by each category; this is reflected in the weights. Examination of Table 2 reveals some substantial differences in weighting patterns. A much higher weight is assigned to the food and health and personal care groups for the age pensioner households index while the wage and salary earner index gives greater weight to housing, transportation and recreation and education. These differences partly reflect the greater mobility and disposable income of wage and salary earner households and a higher incidence of home ownership by age pensioner households.

**Table 2: Weights Used In Constructing Experimental Indexes: Major Commodity Groups  
(a)**

CPI expenditure category	Age pensioner households	Wage and salary earner households
Food	27.774	18.482
clothing	6.519	6.325
Housing	13.413	17.917
Household equipment and operation	18.500	17.997
Transportation	12.951	15.794

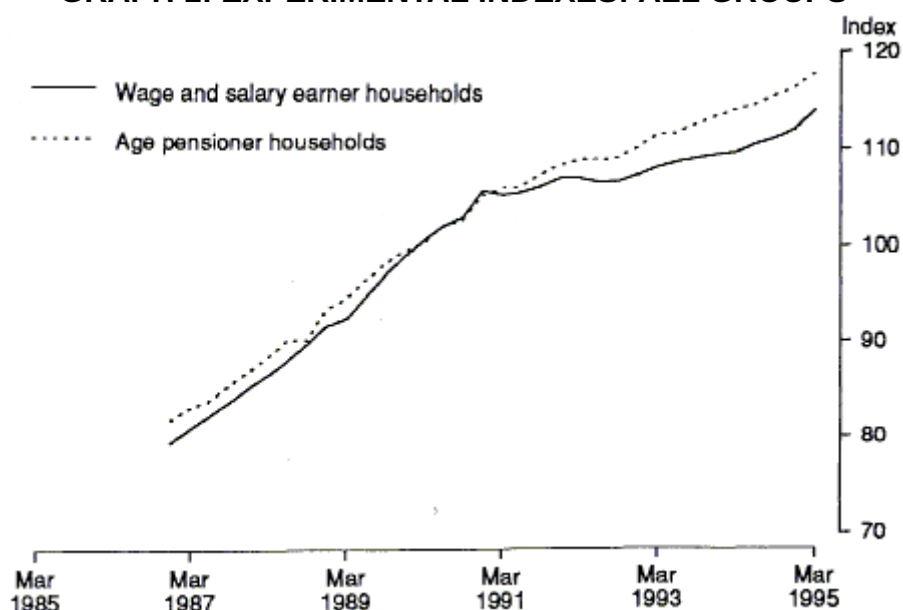
Tobacco and alcohol	6.392	6.810
Health and personal care	8.521	5.994
Recreation and education	5.930	10.681
<b>Total</b>	<b>100.000</b>	<b>100.000</b>

(a) Weights calculated directly from the expenditure aggregates listed in Table 1 may differ slightly from those listed here because weights were derived at the expenditure class level and aggregated to the major commodity group level, with rounding at each stage.

## Index outcomes

Graph 1 shows index levels for both wage and salary earner households and age pensioner households from December quarter 1986 to March quarter 1995. Graph 2 shows the changes in the levels of these indexes since the corresponding quarter of the previous year, from December quarter 1987 to March quarter 1995. From December quarter 1986 to March quarter 1995 the wage and salary earner household index increased by 43.4 per cent while the age pensioner household index increased by 44.0 per cent; a relatively small difference over an eight year period. Casual inspection of Graph 1 might lead to the view that the difference is greater than this because in March quarter 1995 the age pensioner household index was almost three and a half percent higher than the wage and salary earner household index. However, closer examination reveals that the age pensioner household index level was almost three percent higher than the wage and salary earner index in December quarter 1986, so the change in levels has been similar for both indexes.

**GRAPH 1: EXPERIMENTAL INDEXES: ALL GROUPS**



**GRAPH 2: EXPERIMENTAL INDEXES: ALL GROUPS: Change from same quarter of previous year**



The experimental indexes are a measure of the change in prices over time for two distinct population groups. The indexes do not measure the difference in actual prices paid by those population groups. The fact that the index for age pensioner households was three per cent higher than the index for wage and salary earner households in December quarter 1986 does not mean that age pensioner households paid higher prices than wage and salary earner households. As noted above, one of the assumptions made in this study is that both population groups pay the same prices for goods and services covered by the indexes.

While the change in each index over the entire period of the study is similar, the pattern of change has not been the same over shorter periods. From June quarter 1989 to March quarter 1991 the wage and salary earner household index increased faster than the age pensioner household index while from June quarter 1991 to September quarter 1994 the age pensioner household index increased faster than the wage and salary earner household index. The index for wage and salary earner households increased by 6.2 per cent between June quarter 1989 and March quarter 1991 compared to 4.0 per cent for age pensioner households, while the wage and salary earner household index rose 8.9 per cent between June quarter 1991 and September quarter 1994 compared to 13.0 per cent for the age pensioner household index.

### **Main causes of short term variations**

The experimental indexes were constructed by applying different sets of weights to the same prices data. Any differences in the behaviour of the indexes must therefore be due to differences in the weights. However, different weights will give rise to different index outcomes only to the extent that the underlying price series diverge. For example, if all underlying price series increased by 10 per cent over a given period then any price index constructed from these series would increase by 10 per cent regardless of weights. In order for an item in the basket to contribute significantly to differences in the experimental indexes it must satisfy two criteria, namely:

- weights in the two indexes must be significantly different; and
- the item's price series must diverge significantly from the price series for other items.

Weights of selected expenditure classes for each population group are listed in Table 3. The

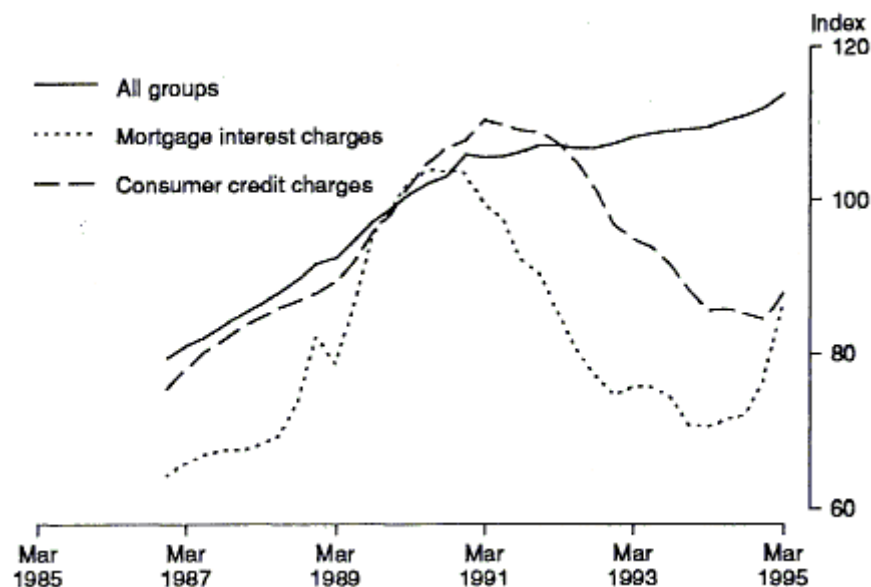
expenditure classes chosen are those for which the weights differ most between population groups, but also include hospital and medical services (selected for reasons set out below).

**Table 3: Weights Used In the Construction of Experimental Indexes, Selected Expenditure Classes**

CPI expenditure category	Age pensioner households	Wage and salary earner households
Take away food	0.773	2.993
Privately owned dwelling rents	4.667	1.201
Government owned dwelling rents	0.395	3.671
Mortgage interest charges	0.141	8.881
Local government rates and charges	4.452	2.035
House repairs and maintenance	3.906	1.779
Consumer credit charges	0.113	2.598
Hospital and medical services	2.709	2.069

The most significant sources of variation in the behaviour of the experimental indexes for wage and salary earner households and age pensioner households are mortgage interest charges and consumer credit charges. These have a combined weight of 11.479 per cent in the wage and salary earner household index compared to 0.254 per cent in the age pensioner household index. Graph 3 is a plot of the mortgage interest charges index, the consumer credit charges index and the all groups (wage and salary earner household) index from December quarter 1986 to March quarter 1995. The divergence between the indexes for consumer credit charges and mortgage interest charges and other time series is pronounced.

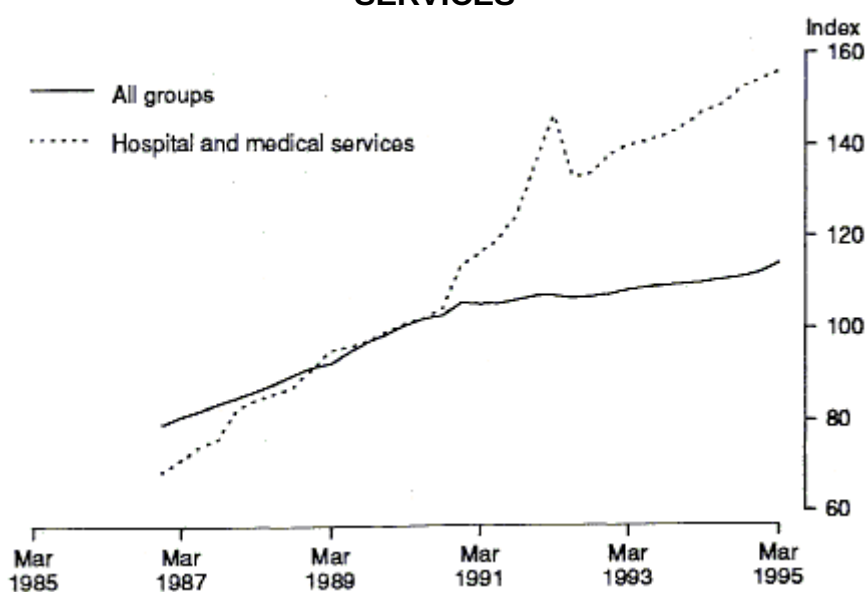
**GRAPH 3: EXPERIMENTAL INDEXES: ALL GROUPS, MORTGAGE INTEREST CHARGES AND CONSUMER CREDIT CHARGES**



During the period when the wage and salary earner household index rose faster than the age pensioner household index (June quarter 1989 to March quarter 1991) the indexes for consumer credit charges and mortgage interest charges were rising much faster than other price series. Similarly, when the index for wage and salary earner households was rising more slowly than the age pensioner household index (June quarter 1991 to September quarter 1994) the consumer credit charges and mortgage interest charges indexes were either falling or rising less rapidly than other price series.

The hospital and medical services expenditure class is a significant, though relatively less important contributor to differences in the behaviour of the two experimental indexes. Prices for hospital and medical services have increased much more rapidly over the period of this study than prices for most goods and services (see Graph 4). Hospital and medical services has a higher weight in the age pensioner household index than in the wage and salary earner household index, and therefore affects the age pensioner household index more than the wage and salary earner index. Between June 1991 and September 1994 hospital and medical services contributed 0.926 points to the rise in the age pensioner household index but only 0.685 points to the rise in the wage and salary earner households index, a difference of 0.241 index points.

**GRAPH 4: EXPERIMENTAL INDEXES: ALL GROUPS AND HOSPITAL AND MEDICAL SERVICES**



An important assumption in this study is that the same set of prices applies to both wage and salary earner households and age pensioner households. While this may be a reasonable assumption for items such as fresh vegetables, clothing, household durables and automotive fuel it is unlikely to be valid for hospital and medical services. Age pensioner households are unlikely to have private hospital cover and are more likely than wage and salary earner households to be bulk billed by medical practitioners. Some other areas of the index where age pensioners are likely to pay different prices to wage and salary earners are rents, dental services, pharmaceuticals and urban transport fares.

Other expenditure classes listed in Table 3 make much smaller contributions to the differences in index outcomes. Although there are significant differences in the weights of these expenditure classes in the different indexes, the price series do not diverge as strongly from one another as do the indexes for mortgage interest charges, consumer credit charges and hospital and medical services.

The experimental indexes presented here exhibit greater short-term variations in behaviour than those in the 1992 Information Paper. This is because the more detailed weighting pattern used in this study allows divergences in low level price series to have a greater impact on aggregate index behaviour.

## Conclusions

This study confirms that price indexes for special population groups constructed using price information collected for use with the CPI are unlikely to differ significantly from the CPI over

periods of time spanning and extending beyond the business cycle. Over shorter time periods, however, significant differences in index behaviour may emerge. These differences are greater when the indexes are constructed using low level rather than more aggregated weights.

This feature article was contributed by John Higgins, ABS.

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This page last updated 23 December 2009

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